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Confirmatory Factor Analysis of the PTSD Checklist and the Clinician-Administered PTSD Scale in Disaster Workers Exposed to the World Trade Center Ground Zero

Patrick A. Palmieri
Summa Health System and Kent State University

Frank W. Weathers
Auburn University

JoAnn Difede
Weill Cornell Medical College of Cornell University

Daniel W. King
Boston University and Veterans Affairs Boston Healthcare System

Although posttraumatic stress disorder (PTSD) factor analytic research has yielded little support for the *DSM–IV* 3-factor model of reexperiencing, avoidance, and hyperarousal symptoms, no clear consensus regarding alternative models has emerged. One possible explanation is differential instrumentation across studies. In the present study, the authors used confirmatory factor analysis to compare a self-report measure, the PTSD Checklist (PCL), and a structured clinical interview, the Clinician-Administered PTSD Scale (CAPS), in 2,960 utility workers exposed to the World Trade Center Ground Zero site. Although two 4-factor models fit adequately for each measure, the latent structure of the PCL was slightly better represented by correlated reexperiencing, avoidance, dysphoria, and hyperarousal factors, whereas that of the CAPS was slightly better represented by correlated reexperiencing, avoidance, emotional numbing, and hyperarousal factors. After accounting for method variance, the model specifying dysphoria as a distinct factor achieved slightly better fit. Patterns of correlations with external variables provided additional support for the dysphoria model. Implications regarding the underlying structure of PTSD are discussed.

Keywords: Clinician-Administered PTSD Scale, confirmatory factor analysis, factor structure, posttraumatic stress disorder, PTSD Checklist

Posttraumatic stress disorder (PTSD) is an anxiety disorder characterized by a diverse collection of symptoms that may develop following exposure to a traumatic life event. Since PTSD was first introduced in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM–III*; American Psychiatric Association [APA], 1980), the diagnostic criteria have undergone extensive revision, and there has been considerable debate over which symptoms should be included and how they should be grouped into relatively homogeneous clusters that presumably reflect underlying dimensions of the disorder. The original criteria in *DSM–III* were rationally derived, based primarily on clinical observations of combat veterans with stress reactions (Andreasen, 1983; Scott, 1990), and consisted of 12 symptoms of PTSD grouped into three clusters. Two of the clusters, reexperiencing and numbing, reflected Horowitz's (1976) biphasic model of stress responses. The third was a heterogeneous collection of symptoms, including guilt, nonspecific memory impairment, avoidance of trauma-related activities, intensification of symptoms in response to trauma-related cues, and several symptoms indicative of autonomic hyperarousal.

The PTSD criteria were substantially altered for *DSM–III–R* (3rd ed., rev.; APA, 1987; Brett, Spitzer, & Williams, 1988). First, the number of symptoms increased from 12 to 17, although this resulted in part from the disaggregation of compound symptoms in the nonspecific third cluster. Second, the reexperiencing cluster was expanded with the addition of a new symptom, distress at exposure to trauma-related cues. Third, the numbing cluster was reconceptualized as an avoidance and numbing cluster. Avoidance of trauma-related activities was moved here, and a second avoidance item, avoidance of trauma-related thoughts or feelings, was added. In addition, nonspecific memory impairment was clarified as psychogenic amnesia for the trauma and also moved here, and sense of a foreshortened future, a symptom thought to be characteristic of children and adolescents, was added to this significantly expanded cluster. Fourth, the heterogeneous third cluster was

Patrick A. Palmieri, Center for the Treatment and Study of Traumatic Stress and Department of Psychiatry, St. Thomas Hospital, Summa Health System, Akron, Ohio, and Department of Psychology, Kent State University; Frank W. Weathers, Department of Psychology, Auburn University; JoAnn Difede, Department of Psychiatry, Weill Cornell Medical College of Cornell University; Daniel W. King, Departments of Psychology and Psychiatry, Boston University, and National Center for Posttraumatic Stress Disorder, Veterans Affairs Boston Healthcare System.

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Correspondence concerning this article should be addressed to Patrick A. Palmieri, Center for the Treatment and Study of Traumatic Stress, St. Thomas Hospital, Summa Health System, 444 North Main Street, 4th Floor, Ambulatory Care Building, Akron, OH 44310. E-mail: palmierp@summa-health.org

reconceptualized as a hyperarousal cluster. In addition to the relocation of avoidance and memory impairment, guilt was removed as a symptom and listed as an associated feature, and two new symptoms, irritability and physiological reactivity to trauma-related cues, were added.

Although these revisions for *DSM–III–R* helped clarify the presumed structure of the PTSD syndrome, particularly with respect to the new hyperarousal cluster, they again were made primarily on rational grounds (Brett et al., 1988). Although the revisions were influenced by emerging descriptive and experimental findings, they were not formally validated, and thus there was insufficient empirical justification regarding the symptom choice, the number of clusters, or the grouping of symptoms into specific clusters. A concerted effort was made to provide an explicit empirical basis for the PTSD syndrome prior to *DSM–IV* (4th ed.; APA, 1994; Davidson & Foa, 1993; Kilpatrick et al., 1998). It is interesting, however, that the most significant change to the PTSD criteria for *DSM–IV* was the revision of the definition of a traumatic event. The only change of note to the PTSD symptoms was the relocation of physiological reactivity from the hyperarousal cluster to the reexperiencing cluster.

This stabilization of the criteria suggests a consensus in the field of traumatic stress that the current 17 symptoms are the essential features of PTSD. This is still an open question, and some investigators have raised a concern that there may be premature closure on the symptom list (e.g., Keane, 1993). However, even assuming that the current list of individual symptoms is valid and reasonably complete, it is not clear that the three current symptom clusters accurately reflect the underlying symptom structure of the disorder. The question remains as to what the underlying dimensions of PTSD actually are, and how they can best be identified and empirically validated.

Questions regarding structural validity evidence are most effectively addressed through factor analysis. Factor structure is worthy of investigation because distinct factors may correspond to distinct underlying mechanisms (Cattell, 1978). Identification of the underlying dimensions of PTSD can shed light on core etiological and maintenance factors and, thus, has important implications for assessing and diagnosing PTSD as well as developing, selecting, and evaluating various clinical interventions. A growing number of studies have used factor analysis to evaluate the *DSM* three-cluster model and search for alternative, better fitting models (see L. A. King, King, Orazem, & Palmieri, 2006).

The first wave of studies on PTSD factor structure used exploratory factor analysis (see Taylor, Kuch, Koch, Crockett, & Passey, 1998, for a review) and uncovered models that were inconsistent with the *DSM* three-factor structure. Although exploratory factor analysis is appropriate for identifying possible factor structures, it is not suitable for confirming a hypothesized structure or for comparing various competing models for goodness of fit. More recently, structural studies of PTSD have used confirmatory factor analysis (CFA; e.g., Asmundson et al., 2000; Asmundson, Wright, McCreary, & Pedlar, 2003; Baschnagel, O'Connor, Colder, & Hawk, 2005; Buckley, Blanchard, & Hickling, 1998; Cordova, Studts, Hann, Jacobsen, & Andrykowski, 2000; DuHamel et al., 2004; D. W. King, Leskin, King, & Weathers, 1998; Marshall, 2004; McWilliams, Cox, & Asmundson, 2005; Palmieri & Fitzgerald, 2005; Palmieri, Marshall, & Schell, in press; Simms, Watson, & Doebbeling, 2002).[1] CFA involves the a priori specification, guided by theory, of the factor or factors on which an item loads and is considered a more powerful and rigorous approach to testing hypothesized factor structures. The CFA studies of PTSD likewise have failed to support the *DSM* three-factor model. Only Cordova et al. (2000) found moderate support for the *DSM* model. Each of the other CFA studies found support for one or more alternative models. Unfortunately, however, these studies have not yielded a clear consensus as to the best alternative factor structure.

The previous CFA studies of PTSD are summarized in Table 1. Some consistency across studies is evident. For example, a model with four distinct but correlated reexperiencing, avoidance, emotional numbing, and hyperarousal factors garnered support in several studies (DuHamel et al., 2004; D. W. King et al., 1998; Marshall, 2004; McWilliams et al., 2005; Palmieri & Fitzgerald, 2005; Palmieri et al., in press). As Table 1 indicates, however, there is considerable variability in the best fit models reported to date. This variability might be attributable in part to differences across studies in samples (e.g., type of trauma, prevalence of PTSD, treatment-seeking status, gender, sample size), measures (e.g., use of non–*DSM*-correspondent instruments or instruments based on different versions of the *DSM*), and analytic strategies (e.g., choice of models to test, estimation method). For example, most CFA studies tested multiple models but not a full range of plausible models; unless different studies tested the identical models, it is difficult to compare their findings.

Another important methodological difference across CFA studies is the choice of assessment instrument. Most studies have used either the PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993), a questionnaire measure, or the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990), a structured diagnostic interview. The PCL and the CAPS are both widely used, well-validated *DSM*-correspondent measures of PTSD, and either is an appropriate choice for a CFA study. However, differences in response modality (i.e., between self-report and clinician ratings) may contribute to differences in CFA results. Our primary aim in the present study was to evaluate the possible impact of assessment modality directly by comparing the CFA results for the PCL and the CAPS, both of which had been administered to a large sample of utility company employees exposed to the 9/11 World Trade Center (WTC) Ground Zero site.

All of the main hypothesized factor structures from previous CFA studies of PTSD were tested with the PCL and the CAPS separately (see Table 2).[2] Model 1 is a one-factor model on which

[1] We elected to focus only on CFA studies with *DSM*-correspondent measures of posttraumatic stress symptoms. See Amdur and Liberzon (2001) and Anthony, Lonigan, and Hecht (1999) for examples of studies that employed other instruments.

[2] Despite their inclusion in previous studies, higher order models with two or three first-order factors serving as indicators of a second-order factor were replaced with first-order versions, as it is generally agreed that at least four first-order factors are necessary to provide evidence for a second-order factor. A hierarchical model with two first-order factors (and without equality of constraints on the loadings) is not identified, and one with three first-order factors is just-identified and equivalent in fit to a correlated three-factor model. We did test hierarchical versions of Models 4a and 4b and, as in several other studies, found that they provided significantly worse fit than their first-order counterparts according to chi-square difference tests. Thus, to simplify presentation of the results, we excluded the hierarchical models from the main analyses.

Table 1
Summary of Previous Posttraumatic Stress Disorder (PTSD) Confirmatory Factor Analysis Studies

Study	Participants	Measure	Models tested	Best fitting model(s)
Buckley et al. (1998)	Motor vehicle accident victims (N = 217)	CAPS	1	Hierarchical two-factor (reexperiencing–avoidance and emotional numbing–hyperarousal)
D. W. King et al. (1998)	Combat veterans (N = 524)	CAPS	4	Correlated four-factor (reexperiencing, avoidance, emotional numbing, hyperarousal)
Asmundson et al. (2000)	Primary care medical clinic referrals (N = 349)	PCL	5	Hierarchical four-factor (reexperiencing, avoidance, emotional numbing, hyperarousal)
Cordova et al. (2000)	Breast cancer survivors (N = 142)	PCL	2	Hierarchical three-factor (reexperiencing, avoidance, hyperarousal)
Simms et al. (2002)	Persian Gulf War veterans and nondeployed controls (N = 3,695)	PCL	6	Correlated four-factor (reexperiencing, avoidance, dysphoria, hyperarousal)
Asmundson et al. (2003)	Military peacekeepers (N = 400)	PCL	3	Buckley et al. (1998) hierarchical two-factor and D. W. King et al. (1998) correlated four-factor
DuHamel et al. (2004)	Cancer survivors with stem cell or bone marrow transplants (N = 236)	PCL	7	D. W. King et al. (1998) four-factor
Marshall (2004)	English-speaking (n = 299) and Spanish-speaking (n = 120) young adult community violence victims	PCL	3	D. W. King et al. (1998) four-factor
Baschnagel et al. (2005)	College students indirectly exposed to the 9/11 World Trade Center terrorist attacks (N = 528)	PDS	7	Simms et al. (2002) four-factor
McWilliams et al. (2005)	Community sample with lifetime history of PTSD (N = 429)	DIS	9	D. W. King et al. (1998) four-factor
Palmieri & Fitzgerald (2005)	Sexual harassment victims (N = 1,218)	PCL	7	D. W. King et al. (1998) four-factor
Palmieri et al. (in press)	Cambodian refugees residing in the United States (N = 488)	HTQ	5	D. W. King et al. (1998) four-factor

Note. CAPS = Clinician-Administered PTSD Scale; PCL = PTSD Checklist; PDS = Posttraumatic Diagnostic Scale; DIS = modified version of the Diagnostic Interview Schedule; HTQ = modified version of the Harvard Trauma Questionnaire.

all 17 PTSD symptoms are specified to load on a general PTSD factor. Although not expected to provide a good fit to the data, we tested it because of the high factor correlations obtained in several CFA studies and because it serves as the most parsimonious alternative for model comparison purposes. Model 2 is a two-factor model based on the two-factor models in the Taylor et al. (1998), Buckley et al. (1998), Simms et al. (2002), and Asmundson et al. (2003) studies. It specifies a reexperiencing–avoidance factor and a numbing–hyperarousal factor. Model 3 is the current *DSM* three-factor model of reexperiencing, avoidance–numbing, and hyperarousal symptoms. Model 4a is the four-factor model of distinct reexperiencing, avoidance, emotional numbing, and hyperarousal factors supported in D. W. King et al. (1998) and several other studies. Model 4b is a different four-factor model, supported in Simms et al. (2002) and Baschnagel et al. (2005), in which numbing symptoms and three hyperarousal symptoms (sleep disturbance, irritability, difficulty concentrating) are reconceptualized as a dysphoria or general distress factor.

Method

Sample

Employees of the utility company who had any exposure to the WTC site underwent company-mandated medical evaluations; however, the mental health screening, which was piggybacked on the medical evaluations, was voluntary. Two percent of employees refused to participate in the mental health screening (see Difede et al., 2007). Ultimately, 3,350 workers were administered the CAPS or the PCL (CAPS n = 3,286, PCL n = 3,209, CAPS and PCL n = 3,182) by trained psychologists supervised weekly by the program director (JoAnn Difede). The sample for the current study consisted of the 2,960 workers with complete data for both the CAPS and the PCL. The excluded individuals (n = 222; 7.0%) did not differ on any demographic variables or on measures of psychopathology.

The sample was almost entirely male (96.9%) and primarily Caucasian (66.2%), with 17.9% African American, 12.8% Hispanic, 1.2% Asian, and 1.9% other. Almost all (97.9%) had completed high school, and most had at least some college education (52.6%). Most were married or cohabiting (75.4%). Average age was 45.2 years (SD = 9.6, range = 17–69 years). Average days worked at the WTC site were 32.5 (SD = 50.0, range = 1–420 days).

Measures

PCL. The PCL (Weathers et al., 1993) is a 17-item, *DSM*-correspondent self-report measure of PTSD. Respondents indicate how much they were bothered by each PTSD symptom over the past month, using a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). The PCL thus yields a continuous measure of PTSD symptom severity with scores ranging from 17 to 85. The PCL also may be scored to yield a dichotomous PTSD diagnosis. This is accomplished by treating each item rated as 3 (*moderately*) or higher as a symptom endorsed, then following the *DSM–IV* diagnostic rule (at least one reexperiencing symptom, three avoidance

Table 2
Item Mapping for Tested Models

DSM–IV PTSD symptom	Model 1	2	3	4a	4b
B1. Intrusive thoughts of trauma	P	R, A	R	R	R
B2. Recurrent dreams of trauma	P	R, A	R	R	R
B3. Flashbacks	P	R, A	R	R	R
B4. Emotional reactivity to trauma cues	P	R, A	R	R	R
B5. Physiological reactivity to trauma cues	P	R, A	R	R	R
C1. Avoiding thoughts of trauma	P	R, A	A	A	A
C2. Avoiding reminders of trauma	P	R, A	A	A	A
C3. Inability to recall aspects of trauma	P	N, H	A	N	D
C4. Loss of interest	P	N, H	A	N	D
C5. Detachment	P	N, H	A	N	D
C6. Restricted affect	P	N, H	A	N	D
C7. Sense of foreshortened future	P	N, H	A	N	D
D1. Sleep disturbance	P	N, H	H	H	D
D2. Irritability	P	N, H	H	H	D
D3. Difficulty concentrating	P	N, H	H	H	D
D4. Hypervigilance	P	N, H	H	H	H
D5. Exaggerated startle response	P	N, H	H	H	H

Note. PTSD = posttraumatic stress disorder. Factors on which symptoms were loaded; P = General PTSD; R = Reexperiencing; A = Avoidance; N = Emotional numbing; H = Hyperarousal; D = Dysphoria.

and numbing symptoms, and two hyperarousal symptoms). The PCL is one of the most widely used self-report measures of PTSD and has been shown to have excellent reliability and validity in a variety of populations (e.g., Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Cordova et al., 1995; Ruggiero, Del Ben, Scotti, & Rabalais, 2003; Weathers et. al., 1993).

CAPS. The CAPS (Blake et al., 1990) is a structured diagnostic interview for PTSD. Interviewers rate the frequency and intensity of each PTSD symptom using separate 5-point scales ranging from 0 to 4. Frequency and intensity ratings may be summed to create a 9-point (0 to 8) severity rating scale for each symptom. The CAPS thus yields a continuous measure of PTSD symptom severity ranging from 0 to 136. As a diagnostic interview, however, the most common use of the CAPS is to establish a diagnosis of PTSD. A number of different scoring rules have been developed for converting CAPS scores into a dichotomous PTSD diagnosis (Weathers, Ruscio, & Keane, 1999). The most commonly used rule is the original F1/I2 rule, whereby a symptom is considered present if the frequency score for a CAPS item is rated as a 1 or higher and the intensity score is rated as a 2 or higher. The CAPS is one of the most widely used PTSD interviews and has been shown to have excellent psychometric properties in a variety of populations (Weathers, Keane, & Davidson, 2001). In the present study, interrater reliability for the CAPS was estimated by having a clinical psychologist with 10 years of experience with the CAPS make independent ratings while observing another clinician conduct the interview; 42 interviews were coded in this manner, and the resulting intraclass correlations ranged from .98 to .99 for the three *DSM–IV* symptom cluster severity scores and CAPS total severity, indicating excellent reliability.

Participants also completed several other self-report measures of psychopathology that were used for external validation purposes, including the Beck Depression Inventory (BDI–II; Beck, Steer, & Brown, 1996), the State Anger Scale of the State–Trait Anger Expression Inventory—2 (STAXI–2; Spielberger, 1999), and the Global Severity Index (GSI) of the Brief Symptom Inventory (Derogatis, 1993). The BDI–II is a 21-item self-report measure of the severity of depressive symptoms in the past 2 weeks, rated on a 4-point scale from 0 to 3, with higher scores indicating higher severity. It has been shown to possess good reliability and validity in a number of populations, including psychiatric outpatients (Beck et al., 1996). The State Anger Scale of the STAXI–2 is a 15-item measure of current anger intensity rated on a 4-point scale from 1 (*not at all*) to 4 (*very much so*). It also has demonstrated good reliability and validity across populations, including normal adults and hospitalized psychiatric patients (Spielberger, 1999). The Brief Symptom Inventory is a 53-item measure of the severity of psychiatric symptoms in the past 7 days (including the day of assessment), rated on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). Its good psychometric properties have been established in psychiatric inpatients, psychiatric outpatients, and nonpatients (Derogatis, 1993). The GSI reflects a general level of psychological distress.

Data Analyses

Both the PCL and the CAPS data were univariately and, thus, multivariately nonnormally distributed (skewness and kurtosis tests for almost every item had $p < .001$), which tends to inflate chi-square values and shrink standard errors, thereby increasing the Type I error rate. To address such nonnormality, we used Satorra and Bentler's (S-B; 1988) chi-square scaling correction. Item covariances and asymptotic covariances were submitted to LISREL 8.71 software (Jöreskog & Sörbom, 1993) for a series of CFAs using robust maximum likelihood estimation, which estimates standard errors under multivariate nonnormality, provides S-B chi squares and computes other chi-square-dependent fit statistics based on the S-B chi square. For all models, each item was specified to load on a single factor, error covariances were constrained to zero, and factors were allowed to correlate. We initially conducted the CFAs separately for the PCL data and CAPS severity data and then tested some models with the PCL and CAPS severity data combined. Descriptive statistics were obtained for PCL and CAPS scales on the basis of the accepted models and for other psychopathology scales. Zero-order correlations among these scales were computed to examine convergent and discriminant validity.

All models were evaluated with multiple fit statistics, including S-B chi square, root-mean-square error of approximation (RMSEA; Steiger, 1990), standardized root-mean-square residual (SRMR; Bentler, 1990), Akaike information criterion (AIC; Akaike, 1987), Bayesian information criterion (BIC; Schwarz, 1978), single-sample expected cross-validation index (ECVI; Browne & Cudeck, 1989), comparative fit index (CFI; Bentler, 1990), and nonnormed fit index (NNFI; Bentler & Bonett, 1980). The AIC, BIC, and ECVI are information theory-based fit indices that are particularly useful for comparing the relative fit of several models, whether or not they are nested. Models with lower RMSEA, SRMR, AIC, BIC, and ECVI values and higher CFI and NNFI values are thought to be relatively better fitting. There is little consensus on the most appropriate cutoff values to use as indications of adequate fit. Conventional guidelines were followed, whereby fit is considered adequate when the RMSEA is .08 or lower (Browne & Cudeck, 1993), the SRMR is .05 or lower (Jöreskog, Sörbom, du Toit, & du Toit, 2000), and the NNFI and CFI are .90 or higher. It is generally accepted practice to evaluate fit through a combination of fit indices; confidence in the results increases as agreement among the fit statistics increases.

Results

Substantial levels of posttraumatic stress symptoms were found in the sample. The prevalence of full PTSD was 9.5% using the PCL diagnostic scoring rule and 8.0% using the CAPS F1/I2 scoring rule. The prevalence of subsyndromal, or partial, PTSD (Blanchard et al., 1995) was also evaluated. To be classified as subsyndromal PTSD, respondents had to meet Criterion B (have at least one reexperiencing symptom) and either Criterion C (three or more numbing and avoidance symptoms) or Criterion D (two or more hyperarousal symptoms). When cases of full and subsyndromal PTSD were combined, indicating the presence of clinically significant PTSD symptoms, the prevalence was 18.8% for the PCL and 17.3% for the CAPS. The mean PCL score was 26.19 ($SD = 11.22$), and the mean CAPS score was 13.06 ($SD = 16.08$).

PCL Factor Analyses

Fit statistics for all models are provided in Table 3. Models 4a and 4b garnered more empirical support than the rest of the models given the fit statistic guidelines described earlier. Their fit values were all in the acceptable range, and they exceeded the suggested cutoffs by a wider margin than the other models. For example, the RMSEA and ECVI 90% confidence intervals did not overlap with those for Models 1, 2, and 3. Furthermore, the AIC and BIC information values for Models 4a and 4b were noticeably smaller than those for all the other models. Between these two models, however, Model 4b appeared to provide slightly better model–data fit. It had the lower values for RMSEA, SRMR, AIC, BIC, and ECVI. The CFI and NNFI values were equivalent for both models.

In addition, as confirmed by the adequately low SRMR value, fitted residuals for Model 4b were generally small, ranging from –.06 to .09 ($Mdn = 0.00$); standardized residuals ranged from –3.59 to 5.57 ($Mdn = 0.00$). Only 15 (9.8%) of the 153 standardized residuals exceeded an absolute value of 3.0. Each item loaded significantly on its respective factor (.77 to .80 for reexperiencing, .78 to .81 for avoidance, .58 to .81 for dysphoria, and .73 to .86 for hyperarousal), and factor correlations ranged from .75 to .84 (see Table 4, which for completeness also provides this information for Model 4a). Thus, the collective evidence suggests that the four-factor model of reexperiencing, avoidance, dysphoria, and hyperarousal provides the best representation of the latent structure of the PCL in this sample.

CAPS Factor Analyses

As with the PCL, Models 4a and 4b seemed to garner more support than Models 1, 2, and 3 (see Table 3). Their fit values were all in the acceptable range, and they exceeded the suggested cutoffs by a wider margin than the other models. For example, the RMSEA and ECVI 90% confidence intervals did not overlap with those for Models 1, 2, and 3. Furthermore, the AIC and BIC information values were noticeably smaller than those for Models 1, 2, and 3. Between these two models, however, Model 4a appeared to provide slightly better model–data fit. It had the lowest values for RMSEA, AIC, BIC, and ECVI and the highest value for NNFI. Its SRMR value was slightly worse than that for Model 4b. The CFI value was the same for both models.

In addition, as confirmed by the low SRMR, fitted residuals for Model 4a were generally small, ranging from –.36 to .48 ($Mdn = 0.00$); standardized residuals ranged from –6.98 to 7.78 ($Mdn = 0.00$). Only 13 (8.5%) of the 153 standardized residuals exceeded an absolute value of 3.0. Each item loaded significantly on its respective factor (.42 to .63 for reexperiencing, .66 to .69 for avoidance, .31 to .78 for emotional numbing, and .45 to .73 for hyperarousal), and factor correlations ranged from .74 to .88 (see

Table 3
Fit Statistics for Maximum Likelihood Confirmatory Factor Analyses

Scale	Model	*df*	S-B χ^2	RMSEA (90% CI)	SRMR	AIC	BIC	ECVI (90% CI)	CFI	NNFI
PCL	1	119	2,578.40	.084 (.081, .086)	.055	2,646.40	2,850.16	0.89 (0.84, 0.95)	.93	.92
PCL	2	118	1,454.91	.062 (.059, .065)	.046	1,524.91	1,734.66	0.52 (0.48, 0.56)	.96	.96
PCL	3	116	1,550.79	.065 (.062, .068)	.046	1,624.79	1,846.53	0.55 (0.51, 0.59)	.96	.95
PCL	4a	113	1,098.70	.054 (.051, .057)	.042	1,178.70	1,418.42	0.40 (0.36, 0.44)	.97	.97
PCL	**4b**	**113**	**1,062.50**	**.053 (.050, .056)**	**.039**	**1,142.50**	**1,382.22**	**0.39 (0.35, 0.42)**	**.97**	**.97**
CAPS	1	119	931.97	.048 (.045, .051)	.044	999.97	1,203.73	0.34 (0.31, 0.37)	.95	.94
CAPS	2	118	761.97	.043 (.040, .046)	.043	831.97	1,041.72	0.28 (0.25, 0.31)	.96	.95
CAPS	3	116	787.92	.044 (.041, .047)	.043	861.92	1,083.66	0.29 (0.26, 0.32)	.96	.95
CAPS	**4a**	**113**	**543.46**	**.036 (.033, .039)**	**.040**	**623.46**	**863.18**	**0.21 (0.19, 0.24)**	**.97**	**.97**
CAPS	4b	113	579.46	.037 (.034, .040)	.037	659.46	899.18	0.22 (0.20, 0.25)	.97	.96
PC	4a	521	6,033.46	.060 (.058, .061)	.054	6,181.46	6,624.94	2.09 (2.01, 2.17)	.94	.94
PC	**4b**	**521**	**5,783.39**	**.058 (.057, .060)**	**.052**	**5,931.39**	**6,374.87**	**2.00 (1.92, 2.09)**	**.94**	**.94**
PC	6a	487	2,928.62	.041 (.040, .043)	.037	3,144.62	3,791.86	1.06 (1.01, 1.12)	.97	.97
PC	**6b**	**487**	**2,352.54**	**.036 (.035, .037)**	**.038**	**2,568.54**	**3,215.78**	**0.87 (0.82, 0.92)**	**.98**	**.98**

Note. The best-fitting models for the PCL, CAPS, and combined PCL and CAPS are in bold type. The BIC is not included in LISREL 8.71 output and was thus calculated separately using the following formula: BIC = S-B $\chi^2 + \ln(N) * t$, where N = sample size and t = number of parameters estimated. PCL = Posttraumatic Stress Disorder (PTSD) Checklist; CAPS = Clinician-Administered PTSD Scale; PC = combined PCL and CAPS; S-B = Satorra–Bentler; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardized root-mean-square residual; AIC = Akaike information criterion; BIC = Bayesian information criterion; ECVI = expected cross-validation index; CFI = comparative fit index; NNFI = nonnormed fit index.

Table 4
Completely Standardized Factor Loadings and Factor Correlations for Posttraumatic Stress Disorder Checklist (PCL) Models 4a and 4b

	PCL Model 4a				PCL Model 4b			
Item	Reexperiencing	Avoidance	Emotional numbing	Hyperarousal	Reexperiencing	Avoidance	Dysphoria	Hyperarousal
1 (Intrusive thoughts of trauma)	.79				.79			
2 (Recurrent dreams of trauma)	.80				.80			
3 (Flashbacks)	.77				.77			
4 (Emotional reactivity to trauma cues)	.77				.77			
5 (Physiological reactivity to trauma cues)	.77				.78			
6 (Avoiding thoughts of trauma)		.78				.78		
7 (Avoiding reminders of trauma)		.81				.81		
8 (Inability to recall aspects of trauma)			.58				.58	
9 (Loss of interest)			.80				.78	
10 (Detachment)			.82				.80	
11 (Restricted affect)			.73				.71	
12 (Sense of foreshortened future)			.77				.77	
13 (Sleep disturbance)				.75			.73	
14 (Irritability)				.80			.78	
15 (Difficulty concentrating)				.82			.81	
16 (Hypervigilance)				.66				.73
17 (Exaggerated startle response)				.78				.86
Factors								
Reexperiencing								
Avoidance	.84				.84			
Emotional numbing–dysphoria	.78	.80			.80	.79		
Hyperarousal	.82	.76	.90		.80	.75	.84	

Table 5, which for completeness also provides this information for Model 4b). Collectively, the evidence suggests that the four-factor model of reexperiencing, avoidance, emotional numbing, and hyperarousal provides the best representation of the latent structure of the CAPS in this sample.

Combined PCL and CAPS Factor Analyses

To provide a more direct evaluation of the role that response modality plays in the differential findings for the PCL and CAPS, we conducted CFAs of the combined PCL and CAPS data, now represented by a 34×34 covariance matrix rather than a 17×17 matrix. Specifically, each supported four-factor model was augmented to include methods factors, given that the essential difference between the PCL and CAPS is in their administration formats. The resulting six-factor models included the four symptom factors and two methods factors (paper-and-pencil and clinical interview). Each item was specified to load on one symptom factor and the appropriate method factor. Symptom factors were allowed to correlate with each other, whereas methods factors were not allowed to correlate with each other or with symptom factors.

Models 6a and 6b, the six-factor versions of Models 4a and 4b, fit better than their four-factor counterparts across all fit statistics (see Table 3). Furthermore, Model 6b provided better fit than Model 6a for all fit indices except the SRMR, which was only .001 lower for Model 6a. Thus, after partialing out administration method effects, the Simms et al. (2002) four-factor model seemed to provide better fit than the D. W. King et al. (1998) four-factor model.

Fitted residuals for Model 6b were generally small, ranging from –.38 to .48 (*Mdn* = 0.00); standardized residuals ranged from –7.22 to 12.91 (*Mdn* = 0.01). Only 39 (7.7%) of the 505 standardized residuals exceeded an absolute value of 3.0. Each item loaded significantly on its respective symptom factor (.35 to .80 for reexperiencing, .57 to .78 for avoidance, .25 to .83 for dysphoria, and .53 to .86 for hyperarousal). Item loadings on the methods factors were significant but not very high. PCL item loadings on the paper-and-pencil method factor ranged from –.32 to .15. CAPS item loadings on the interview method factor ranged from .14 to .48. Symptom factor correlations ranged from .77 to .84. Table 6 provides factor loadings and factor correlations for Model 6b and, again for completeness, Model 6a. Collectively, the evidence suggests that the four-factor model of correlated reexperiencing, avoidance, dysphoria, and hyperarousal symptoms provides the best representation of the latent structure of PTSD.

Agreement Between PCL and CAPS Scales

Descriptive statistics for the PCL and CAPS scales based on Models 4a and 4b are presented in Table 7. Intercorrelation matrices for the PCL and CAPS scales under Models 4a and 4b are provided in Tables 8 and 9, respectively. Within the heteromethod blocks of these tables, the convergent correlations for the subscales (e.g., PCL Reexperiencing with CAPS Reexperiencing) were substantial, ranging from .58 to .74. In addition, each of these correlations was significantly higher than all the other subscale coefficients in its row or column of the heteromethod block (*zs* = 3.05–22.16, *ps* $<$ .001). Thus, the PCL self-ratings and the CAPS

Table 5
Completely Standardized Factor Loadings and Factor Correlations for Clinician-Administered Posttraumatic Stress Disorder Scale (CAPS) Models 4a and 4b

	CAPS Model 4a				CAPS Model 4b			
Item	Reexperiencing	Avoidance	Emotional numbing	Hyperarousal	Reexperiencing	Avoidance	Dysphoria	Hyperarousal
1 (Intrusive thoughts of trauma)	.55				.55			
2 (Recurrent dreams of trauma)	.55				.55			
3 (Flashbacks)	.42				.42			
4 (Emotional reactivity to trauma cues)	.63				.63			
5 (Physiological reactivity to trauma cues)	.58				.59			
6 (Avoiding thoughts of trauma)		.69				.68		
7 (Avoiding reminders of trauma)		.66				.67		
8 (Inability to recall aspects of trauma)			.31				.31	
9 (Loss of interest)			.77				.76	
10 (Detachment)			.78				.73	
11 (Restricted affect)			.71				.66	
12 (Sense of foreshortened future)			.53				.53	
13 (Sleep disturbance)				.69			.66	
14 (Irritability)				.73			.71	
15 (Difficulty concentrating)				.69			.68	
16 (Hypervigilance)				.45				.54
17 (Exaggerated startle response)				.57				.65
Factors								
Reexperiencing								
Avoidance	.85				.85			
Emotional numbing–dysphoria	.76	.74			.83	.80		
Hyperarousal	.88	.83	.85		.85	.84	.74	

interviewer ratings showed both strong convergence and a reasonable level of discriminant validity.

External Validation

Scale descriptive statistics for the BDI–II, STAXI–2, and GSI are presented in Table 7. Zero-order correlations between these external variables and the PCL and CAPS scales are displayed in Table 10. If factors are indeed distinct, they should be differentially correlated with external variables. We expected numbing–dysphoria to correlate stronger than other symptom clusters with the BDI–II on the basis of previous literature (e.g., Asmundson, Stein, & McCreary, 2002; Constans, Lenhoff, & McCarthy, 1997) and with the GSI by definition. We also expected hyperarousal for Model 4a and dysphoria for Model 4b, both of which include anger as a symptom, to correlate strongest with the STAXI–2.

Under Model 4a, the PCL Avoidance and PCL Emotional Numbing subscales were clearly differentiable across the external variables, supporting the separation of *DSM* avoidance and numbing symptom criteria. However, the only subscale that correlated strongest with an external variable was PCL Hyperarousal with GSI (.80), although the magnitude of this correlation was only .02 higher than that for the PCL Emotional Numbing subscale, which was the next strongest correlation. On the other hand, under Model 4b the PCL Dysphoria subscale had the strongest correlations with all three external variables (.80 with BDI–II, .46 with STAXI–2, and .83 with GSI). Furthermore, the magnitudes of the differences between the Dysphoria subscale and the next strongest subscale were larger, ranging from .03 to .18.

Under Model 4a, the CAPS Avoidance and Emotional Numbing subscales were clearly differentiable, supporting the separation of *DSM* avoidance and numbing symptom criteria. However, it was the CAPS Hyperarousal subscale that correlated strongest with all three external variables (.65 with BDI–II, .45 with STAXI–2, and .66 with GSI), although the magnitudes of the differences between the Hyperarousal subscale and the next strongest subscale ranged from only .02 to .05. On the other hand, under Model 4b, the CAPS Dysphoria subscale correlated the highest with all three external variables (.70 with BDI–II, .45 with STAXI–2, and .70 with GSI). Furthermore, the sizes of the differences in coefficients for the Dysphoria subscale and the next strongest subscale were more substantial, ranging from .07 to .16. Overall, the pattern of correlations showed that PTSD subscales created under Model 4b tended to be more uniquely associated with external correlates than were subscales created under Model 4a, although this particular set of external variables measured the very types of symptoms (e.g., depression, anger, and general distress) that comprise the Dysphoria subscale.

Discussion

This is the first PTSD CFA study to use two measures of PTSD symptoms in a single sample. This study replicates previous CFA studies of PTSD by evaluating multiple structural models and

Table 6

Completely Standardized Factor Loadings and Factor Correlations for the Combined Posttraumatic Stress Disorder Checklist and Clinician-Administered Posttraumatic Stress Disorder Scale Models 6a and 6b

	Model 6a						Model 6b					
Item	Reexperiencing	Avoidance	Emotional numbing	Hyperarousal	Paper	Interview	Reexperiencing	Avoidance	Dysphoria	Hyperarousal	Paper	Interview
Posttraumatic Stress Disorder Checklist												
1 (Intrusive thoughts of trauma)	.77				.20		.80				.01	
2 (Recurrent dreams of trauma)	.79				.12		.79				−.15	
3 (Flashbacks)	.75				.14		.75				−.17	
4 (Emotional reactivity to trauma cues)	.75				.18		.78				.05	
5 (Physiological reactivity to trauma cues)	.77				.07		.77				−.12	
6 (Avoiding thoughts of trauma)		.78			.09			.77			−.13	
7 (Avoiding reminders of trauma)		.80			.09			.78			−.26	
8 (Inability to recall aspects of trauma)			.58		.02				.54		−.24	
9 (Loss of interest)			.80		−.10				.74		−.32	
10 (Detachment)			.81		−.25				.76		−.31	
11 (Restricted affect)			.73		−.25				.68		−.29	
12 (Sense of foreshortened future)			.78		.08				.75		−.14	
13 (Sleep disturbance)				.75	−.12				.76		.05	
14 (Irritability)				.79	−.19				.82		.15	
15 (Difficulty concentrating)				.81	−.26				.83		.04	
16 (Hypervigilance)				.68	.27					.75	.03	
17 (Exaggerated startle response)				.80	.13					.86	−.04	

Table 6 (*continued*)

Item	Model 6a						Model 6b					
	Reexperiencing	Avoidance	Emotional numbing	Hyperarousal	Paper	Interview	Reexperiencing	Avoidance	Dysphoria	Hyperarousal	Paper	Interview
Clinician-Administered Posttraumatic Stress Disorder Scale												
1 (Intrusive thoughts of trauma)	.51					.20	.51					.22
2 (Recurrent dreams of trauma)	.48					.27	.46					.29
3 (Flashbacks)	.36					.17	.35					.19
4 (Emotional reactivity to trauma cues)	.56					.26	.57					.25
5 (Physiological reactivity to trauma cues)	.49					.28	.48					.30
6 (Avoiding thoughts of trauma)		.58				.34		.57				.35
7 (Avoiding reminders of trauma)		.57				.29		.57				.31
8 (Inability to recall aspects of trauma)			.28			.18			.25			.20
9 (Loss of interest)			.61			.47			.59			.48
10 (Detachment)			.60			.46			.56			.47
11 (Restricted affect)			.54			.41			.51			.42
12 (Sense of foreshortened future)			.45			.30			.41			.32
13 (Sleep disturbance)				.61		.32			.60			.28
14 (Irritability)				.63		.38			.63			.32
15 (Difficulty concentrating)				.58		.38			.59			.35
16 (Hypervigilance)				.46		.11				.53		.14
17 (Exaggerated startle response)				.49		.28				.54		.30
Factors												
Reexperiencing												
Avoidance	.84						.84					
Emotional numbing–dysphoria	.83	.81					.81	.77				
Hyperarousal	.86	.78	.88				.82	.78	.81			

Table 7
Scale Descriptive Statistics

Scale	Items (n)	α	Observed range	M	SD
PCL total (Model 4a)	17	.94	17–83	26.19	11.22
Reexperiencing	5	.88	5–25	8.02	3.64
Avoidance	2	.77	2–10	3.02	1.65
Emotional numbing	5	.85	5–25	6.95	3.25
Hyperarousal	5	.76	5–25	8.20	4.06
PCL total (Model 4b)	17	.94	17–83	26.19	11.22
Reexperiencing	5	.88	5–25	8.02	3.64
Avoidance	2	.77	2–10	3.02	1.65
Dysphoria	8	.90	8–40	11.65	5.41
Hyperarousal	2	.76	2–10	3.49	1.96
CAPS total (Model 4a)	17	.89	0–95	13.06	16.08
Reexperiencing	5	.66	0–35	3.08	4.27
Avoidance	2	.62	0–16	1.70	2.91
Emotional numbing	5	.75	0–31	2.40	4.82
Hyperarousal	5	.74	0–35	5.87	6.94
CAPS total (Model 4b)	17	.89	0–95	13.06	16.08
Reexperiencing	5	.66	0–35	3.08	4.27
Avoidance	2	.62	0–16	1.70	2.91
Dysphoria	8	.84	0–47	5.35	8.77
Hyperarousal	2	.48	0–16	2.92	3.27
BDI–II	21	.92	0–45	4.93	6.60
STAXI–2	15	.95	15–60	16.52	4.42
GSI	53	.98	0–3.04	0.30	0.46

Note. ns = 2,960 for PCL, CAPS, and BDI–II scales; n = 1,175 under listwise deletion for the STAXI–2; n = 2,879 for the GSI, which was not administered to all participants. PCL = Posttraumatic Stress Disorder (PTSD) Checklist; CAPS = Clinician-Administered PTSD Scale; BDI–II = Beck Depression Inventory—II; STAXI–2 = State Anger Scale; GSI = Global Severity Index of the Brief Symptom Inventory.

using psychometrically sound, *DSM*-correspondent instruments. It extends previous studies by directly comparing a questionnaire (PCL) and a structured interview (CAPS) and by employing a large sample of civilians with terrorism-related trauma exposure. The primary findings were that, although different four-factor models provided reasonable model–data fit for both measures, the PCL and the CAPS seemed to have slightly different latent structures, and a dysphoria model was slightly superior after accounting for instrument type with method factors. The PCL CFAs supported a four-factor model with distinct reexperiencing, avoidance, dysphoria, and hyperarousal factors, replicating Simms et al. (2002). The CAPS CFAs, on the other hand, supported a four-factor model with distinct reexperiencing, avoidance, emotional numbing, and hyperarousal factors, replicating D. W. King et al. (1998) and a number of other studies. Thus, although these differences were generally slight, it appears that at least some of the heterogeneity of PTSD factor analytic research results might be attributable to differences in instrumentation.

Table 8
Zero-Order Correlations for Scales Based on Model 4a

Scale	1	2	3	4	5	6	7	8	9	10
1. PCL total	—									
2. Reexperiencing	.90	—								
3. Avoidance	.80	.70	—							
4. Emotional numbing	.90	.70	.67	—						
5. Hyperarousal	.92	.74	.63	.79	—					
6. CAPS total	.78	.68	.63	.70	.74	—				
7. Reexperiencing	.67	.66	.53	.56	.60	.83	—			
8. Avoidance	.57	.50	.58	.49	.51	.75	.56	—		
9. Emotional numbing	.63	.51	.49	.66	.57	.84	.59	.55	—	
10. Hyperarousal	.72	.62	.54	.61	.73	.91	.65	.59	.66	—

Note. All coefficients are significant at the .01 alpha level (two-tailed). n = 2,960 for all PCL and CAPS scales. PCL = Posttraumatic Stress Disorder (PTSD) Checklist; CAPS = Clinician-Administered PTSD Scale.

Table 9
Zero-Order Correlations for Scales Based on Model 4b

Scale	1	2	3	4	5	6	7	8	9	10
1. PCL total	—									
2. Reexperiencing	.90	—								
3. Avoidance	.80	.70	—							
4. Dysphoria	.94	.73	.67	—						
5. Hyperarousal	.81	.67	.57	.70	—					
6. CAPS total	.78	.68	.63	.74	.64	—				
7. Reexperiencing	.67	.66	.53	.59	.53	.83	—			
8. Avoidance	.57	.50	.58	.51	.46	.75	.56	—		
9. Dysphoria	.72	.59	.54	.74	.54	.93	.66	.60	—	
10. Hyperarousal	.54	.49	.43	.44	.59	.69	.50	.47	.49	—

Note. All coefficients are significant at the .01 alpha level (two-tailed). n = 2,960 for all PCL and CAPS scales. PCL = Posttraumatic Stress Disorder (PTSD) Checklist; CAPS = Clinician-Administered PTSD Scale.

Table 10
Zero-Order Correlations Between Posttraumatic Stress Disorder (PTSD) Scales and External Variables

Scale	BDI–II	STAXI–2	GSI
PCL Total (Model 4a)	.77	.48	.81
Reexperiencing	.62	.43	.65
Avoidance	.55	.37	.58
Emotional numbing	.76	.44	.78
Hyperarousal	.75	.45	**.80**
PCL Total (Model 4b)	.77	.48	.81
Reexperiencing	.62	.43	.65
Avoidance	.55	.37	.58
Dysphoria	**.80**	**.46**	**.83**
Hyperarousal	.60	.38	.66
CAPS Total (Model 4a)	.70	.47	.72
Reexperiencing	.54	.38	.57
Avoidance	.46	.34	.49
Emotional numbing	.62	.40	.64
Hyperarousal	**.65**	**.45**	**.66**
CAPS Total (Model 4b)	.70	.47	.72
Reexperiencing	.54	.38	.57
Avoidance	.46	.34	.49
Dysphoria	**.70**	**.45**	**.70**
Hyperarousal	.43	.34	.46

Note. All coefficients are significant at the .01 alpha level (two-tailed). n = 2,960 for BDI–II correlations; n = 1,175 under pairwise deletion for the STAXI–2 correlations; n = 2,879 for the GSI correlations. Separately for PCL Model 4a, PCL Model 4b, CAPS Model 4a, and CAPS Model 4b subscales, within each column a boldfaced coefficient is significantly larger than the others. PCL = PTSD Checklist; CAPS = Clinician-Administered PTSD Scale; BDI–II = Beck Depression Inventory—II; STAXI–2 = State Anger Scale; GSI = Global Severity Index of the Brief Symptom Inventory.

It is noteworthy that the three-factor model currently delineated in *DSM–IV* received virtually no support in the PCL or the CAPS. This is consistent with most PTSD CFA research to date. Thus, there is considerable evidence suggesting that a modification to the structural representation of PTSD is warranted for the next edition of the *DSM*, particularly that the current avoidance symptoms be split into distinct factors. The exact nature of this split, however, is less clear at this time.

One possible conclusion, based on the results for the PCL data and the slight advantage of the Simms et al. (2002) model after partialing out methods effects, is that the diagnostic criteria should be revised to reflect distinct reexperiencing, avoidance, dysphoria, and hyperarousal factors. Such a conceptualization would relate the structure of PTSD to structural models of depression and anxiety more generally (e.g., Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Zinbarg & Barlow, 1996) that attempt to differentiate general and specific components of disorders. Dysphoria (e.g., sleep problems, difficulty concentrating) commonly occurs in depressive and anxiety disorders and is thus thought to be a general or nonspecific component of these disorders. Reexperiencing, on the other hand, is thought to be a rather specific component of PTSD. Evidence for such a revision of the PTSD diagnostic criteria should be considered tentative, however, given that (a) studies directly comparing the different four-factor models have produced mixed results (e.g., McWilliams et al., 2005, and Palmieri & Fitzgerald, 2005, found more support for models that included emotional numbing rather than dysphoria), and (b) lumping together depressive symptoms and emotional numbing symptoms into a dysphoria factor is inconsistent with evidence supporting the distinctness of these symptoms (e.g., Feeny, Zoellner, Fitzgibbons, & Foa, 2000).

Another possibility to consider, given the nonspecific nature of dysphoria as it relates to PTSD, is that the PTSD criteria should include only the specific factors of reexperiencing, avoidance, and hyperarousal symptoms. That is, if dysphoria truly is a general component of PTSD and thus does not serve to differentiate PTSD from other diagnostic categories, perhaps it does not warrant inclusion as a diagnostic criterion for PTSD. We believe, however, that criteria should not be based solely on whether they differentiate among distinct disorders, but also on whether they are important for a given construct regardless of their relevance to other constructs. After all, dysphoria may well be a critical element of PTSD as well as other disorders, such as major depressive disorder.

In contrast, another possible conclusion is that the diagnostic criteria should be revised to reflect the D. W. King et al. (1998) four-factor model of distinct reexperiencing, avoidance, emotional numbing, and hyperarousal symptoms. This model fit best for the CAPS data and acceptably well for the PCL data in the current study and was the best fitting model in several other studies, including the only two studies that compared both of these four-factor models (McWilliams et al., 2005; Palmieri & Fitzgerald, 2005). An argument for this model also can be made given that structured clinical interviews such as the CAPS involve follow-up questions and probes that offer the opportunity for clarification and, thus, increased validity relative to paper-and-pencil measures. This is particularly important given anecdotal clinical observations that some individuals with PTSD do not fully realize that they are engaging in avoidance behavior, do not appreciate that they are emotionally numb, and tend to emphasize general dysphoria and distress more than other symptoms that might be more central to PTSD. Although it can be argued that interviewer knowledge about which symptoms cluster together in the *DSM* can influence CAPS ratings (e.g., halo effect) and, thus, factor solutions, if this bias occurs, it most likely would result in support for the three-factor model, as that is represented in the *DSM*. It is clear, however, that further investigation of emotional numbing and dysphoria is needed before revising the PTSD symptom criteria.

There are a number of clinical reasons to separate the current *DSM* Criterion C symptoms into avoidance and either emotional numbing or dysphoria, two substantially overlapping constructs in which numbing is actually subsumed by the more global dysphoria factor (see Asmundson, Stapleton, & Taylor, 2004, for a comprehensive discussion of the distinctiveness of avoidance and emotional numbing). First, there is some evidence that high emotional numbing at baseline, but not high avoidance (or any other symptom cluster), is predictive of poorer response to cognitive–behavioral treatment (Taylor et al., 2001). Related to this is a finding that exposure therapy is more effective than relaxation and eye movement desensitization and reprocessing in reducing avoidance symptoms but is no better at reducing emotional numbing symptoms (Taylor et al., 2003). There also appear to be distinct self-report and behavioral correlates for avoidance and emotional numbing. For example, several researchers have reported that self-reported emotional numbing correlates higher with depression than does avoidance (e.g., Asmundson et al., 2002). In addition, self-reported emotional numbing, but not avoidance, was found to correlate negatively with an attentional bias toward positively valenced words on an emotional Stroop task (Palmieri & Berenbaum, 2003). Findings such as these are likely to remain hidden if PTSD assessment occurs under the *DSM* three-factor conceptualization that lumps avoidance and emotional numbing together. Thus, assessment under a four-factor model can illuminate treatment selection, measurement of treatment course and outcome, and identification of risk factors and comorbid conditions. It also suggests that there is potential value in reanalyzing data from previous studies to examine correlates of the broader dysphoria construct in addition to emotional numbing.

As found in most previous research, the psychogenic amnesia item (Criterion C3, memory difficulty) did not load as high on its respective factor (emotional numbing–dysphoria) as the other items did. In the past, it has been suggested that this may be due in part to poor item wording. However, the fact that similar results were found in the present study for both a questionnaire with fixed wording and a clinical interview that allows for additional information and clarification suggests otherwise. Rather, it seems more likely to be due to the relatively low base rate of memory deficits or to such deficits, by their nature, being difficult to convey accurately through self-report, be it via paper-and-pencil or clinical interview.

One limitation of the present study is the relatively low prevalence of PTSD, which raises the possibility that the findings may not replicate in higher risk samples. Nonetheless, the proportion of respondents meeting criteria for full and subsyndromal PTSD in this predominantly male sample was 3 to 4 times higher than the 5% lifetime prevalence of PTSD found for males in the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), and there was sufficient variability in the CAPS and

PCL scores to justify the correlational and structural analyses. Furthermore, taxometric studies have shown the PTSD construct to be dimensional rather than taxonic (e.g., Forbes, Haslam, Williams, & Creamer, 2005; Ruscio, Ruscio, & Keane, 2002), which suggests that investigating factor structure across the full range of symptom severity is appropriate and informative. Another limitation is that both four-factor models specify only two indicators of avoidance and the Simms et al. (2002) model specifies only two indicators of hyperarousal. Ideally, analysis would include several indicators of each putative factor to increase confidence that the factorial domain was fully measured and the factorial solution was stable. Given that this was a study of two existing measures of PTSD symptoms designed to assess the existing *DSM* PTSD criteria, this was unavoidable. However, future research should develop additional avoidance and hyperarousal items to further examine the stability of the four-factor solutions (see Asmundson et al., 2004, for example avoidance items). Finally, additional research is needed on potential correlates of the distinct factors of posttraumatic stress symptoms to provide further validation of the structural findings.

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